

Nayak et al.: EDMS based workflow..., ACTA GRAPHICA 24(2013)1–2, 47–54

TEHNICAL PAPER

RECEIVED: 22-10-2012

ACCEPTED: 24-02-2013

ACTA GRAPHICA 216

## EDMS based workflow for Printing Industry

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### Abstract:

Information is an indispensable factor for any enterprise. It can be a record or a document generated for every transaction that is made for future reference, either in paper or in a digital format. Printing industry is one such industry in which managing information in various formats with latest workflows and technologies could be a nightmare or a challenge for any operator or a user when each process, from a last bit of information to a printed product, always depends on another process. Information has to be harmonized artistically in order to avoid production downtime or employees pointing fingers at each other. This paper analyses how the implementation of *Electronic Document Management System* (EDMS) could help the printing industry to access stored documents immediately within and across departments, irrespective of geographical boundaries. This paper initially outlines a brief history, the contemporary EDMS system and some illustrated examples alongside a study conducted by a Library as a pilot area for evaluating EDMS. The paper ends with an imitative proposal that maps several document management-based activities for the implementation of EDMS for printing industry.

### Keywords:

EDMS, Prepress, Workflow, Printing

## 1. Introduction

Timely access to critical information separates the winners from the losers in the today's information economy. Yet, it still happens all too often that skilled workers fail in their quest to obtain the information they need. There are many

reasons for this failure - some of technical, some of cultural and some of personal nature. Whatever the cause may be, the amount of time wasted in futile search for vital information is enormous, leading to staggering costs to the enterprise.

In any business organization, managing files is the art of knowledge and behaviour (*Feldman & Sherman, 2001*). The fundamentals of managing paper-based files and digital files are different. Improper management of the files may result in the misplacement of the files, missing files and time delays to retrieve the files for usage. Even in the today's digital world, many organizations still function almost entirely in a "paper-driven" environment. This environment is a direct result of the need to maintain information on all aspects of the organization and can be seen in many organizations (*Giandon, Mendes Junior & Scheer, 2002*).

Information is nowadays created and received in a variety of forms – paper, e-mail, electronic fax, the Internet, not to mention numerous computer applications which service your business. In order not to waste large storage space, effective management of these documents has always been a challenge. Information is useless if it cannot be found and retrieved at the right time. Lack of information sharing among people, poor accessibility of information when required and lack of good management of information assets make information less accessible to the users.

The application of EDMS is a versatile solution which enables the user to store information in a systematic way, thus providing an option for instant access to the data stored along with its proper management. EDMS is a software program that serves as an access portal to other applications. By digitizing critical documents we facilitate the storage, access and control to large information repositories to one or more working groups in an enterprise, which results in greater productivity, as shown in the sample below.

## 2. Related Work and Experimental Setup

### 2.1 RELATED WORK

Each printing industry has its own setup depending on the nature of its work. Machines may differ, printing process may differ, some

may have a very huge web offset-based printing setup and some only a small Desktop Publishing setup. The data they use may differ from one organization to another, some may have to do some confidential work and some may have to do additional advertising. Whatever the nature of work or the process may be, information is required for all their activities, ranging from a job ticket to digital library. Normally, a full-fledged printing industry will have prepress, press and the postpress/packaging units.

Printing industry is a growing enterprise providing service to almost all companies and enterprises. It is hardly ever seen in this industry, the documents are managed well. Documents in different sections of this industry have to be managed, stored and retrieved quickly. Many small and big stake holders keep their documents in either hard or soft copy. In this case searching for a specific document would take a long time. With the implementation of EDMS in the printing industry, documents can be stored, indexed and retrieved instantly and effectively to meet user's needs.

Over the past 25 years, the industry has experienced a significant shift from developing custom technology solutions at the database level to configuring and implementing commercially available software. As the EDMS industry and associated technologies matured, end user organizations were able to shift from a "development" model to a "configuration" model for the basic technological components. In the early phase of the development and maturity of EDMS technologies, end user organizations were required to provide database administration and resources. During the late 1980s and early 1990s, the EDMS technologies had not matured to the level resembling that of Commercially Available Off-the-Shelf (COTS). While the EDMS technologies were maturing, end user organizations were required to maintain the database along with the application (*Giandon, Mendes Junior & Scheer, 2002*).

There are several printing companies that use ERP, SAP-based environment for their daily activities, but no software package provided an

end-to-end solution to serve for managing their files electronically for their ongoing process. Some of the softwares only had archival module, so whereas features like viewing an archived file were not available, some were too complex for the end user to understand and some even lacked basic features and were extremely expensive. They have always been criticized for their high costs, long implementation time, considerable maintenance costs and the fact that they do not offer an end-to-end solution (Laudon & Laudon, 2006).

There are also a few common problems with ERP, one of which is a resistance to changes when, for example, some employees become reluctant to learn new techniques or accept new responsibilities. Another problem mentioned is poor training of end users who, when the system is rolled out, do not know how to use it and maintain it continually. The challenges are rooted to the fact that enterprise technology requires not only technological changes but also fundamental changes in the way business operates (Al Mashari, 2002; Kwatsha, 2010 ).

Library is a collection of technical, general books, journals, magazines, question papers, DVDs etc. These are available for faculty students and students of institutes. The Library

Information Services provides both demanding and anticipatory library services to the users. The services provided are lending, reference, textbook, photocopying, CDROM, online journals, question paper service etc.

## 2.2 EXPERIMENTAL SETUP

This paper delivers information on about 3000 indexed and quality checked different documents which include journals, question papers, project reports and seminar reports. The EDMS was installed on a standalone server with a high speed document scanner as a host for scanning any incoming documents. Cabinets were created for different users to access indexed documents (Journals and Question Papers) from the standalone computer. Random documents were chosen for evaluating access time from the system and a comparison was made between the traditional way of accessing documents and new EDMS way.

Data flow of the existing system in the library shows that there are many places for modification. The current and proposed data flow of accessing Journals and Question Papers can be summarised as in Figure 1 and Figure 2.

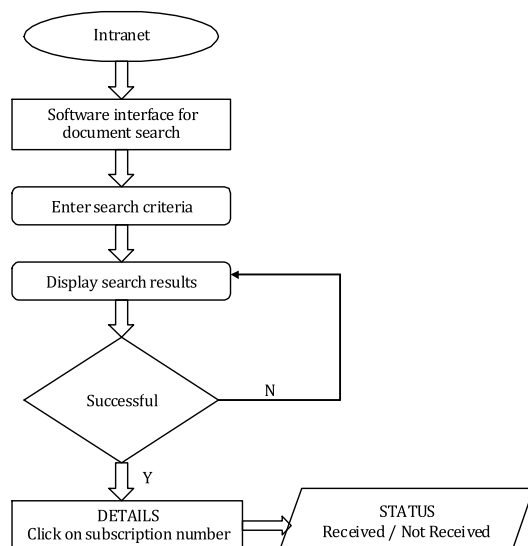


Figure 1. Data flow in existing setup for accessing Journals

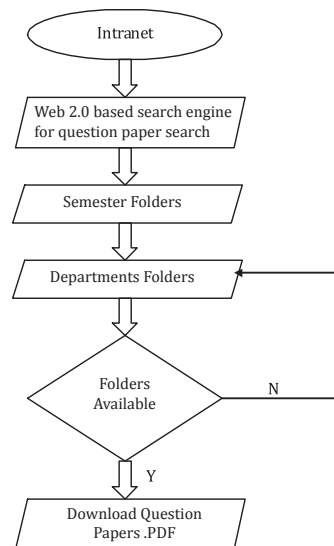


Figure 2 Data flow in existing setup for accessing Question papers

### 3. Proposed Work

Workflow provides the automation of processes, thus enabling users to control the process logic. This ability to control various processes facilitates mission-critical, content-centric business applications to operate in an environment otherwise cumbersome to implement and manage. This has resulted in most EDMS vendors offering an integrated workflow engine or integrating workflow engine with various workflow products readily available throughout the industry. The primary difference between these two approaches is whether the product consists of only those components developed by the primary product supplier or the primary product supplier has integrated specialized technologies developed by other suppliers.

Workflow computing is the automation of work processes performed in an organization. A workflow application automates the sequence of actions, activities or tasks used to run the process. This includes tracking the status of each occurrence of the process and providing tools to manage the process. In the following sections an assessment is done while considering the Library as a pilot area to implement EDMS and to evaluate the efficiency of EDMS to store, access and search through the documents.

EDMS has become an all-encompassing term, referring to the integration of various underlying technologies, including (\*\*\*) 2007):

- Document imaging (used to convert hard-copy documents into digital format)
- Document imaging (used to convert hard-copy documents into digital format)
- Document/Library services (used to manage digitally born documents)
- Workflow (used to route, track, and otherwise manage electronic documents and work activities)
- Enterprise Report Management (ERM) (used to store electronically formatted reports)
- Forms Management (used to incorporate interactive forms and manage related forms data)
- Optical Character Recognition (OCR)/ Intelligent Character Recognition (ICR) technologies

EDMS technologies can be viewed as a set of building blocks; the lowest level is the operating system. Database services and storage device drivers are installed into the server as the second layer. The selection of a database is typically the discretion of the organization, but is often standardized with Open DataBase Connectivity (ODBC) (\*\*\*) 2007).

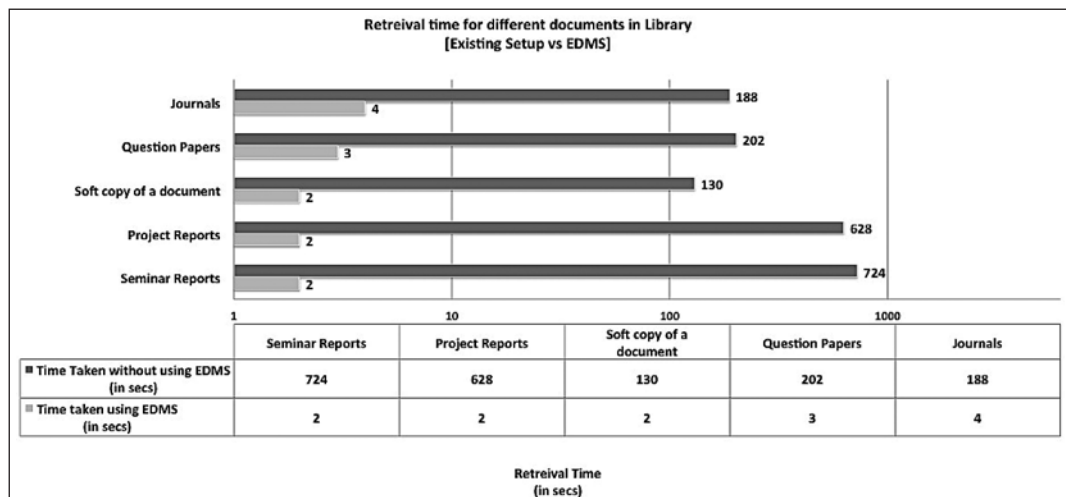


Figure 3: Document accessibility performance compared w.r.t time using existing setup with EDMS software

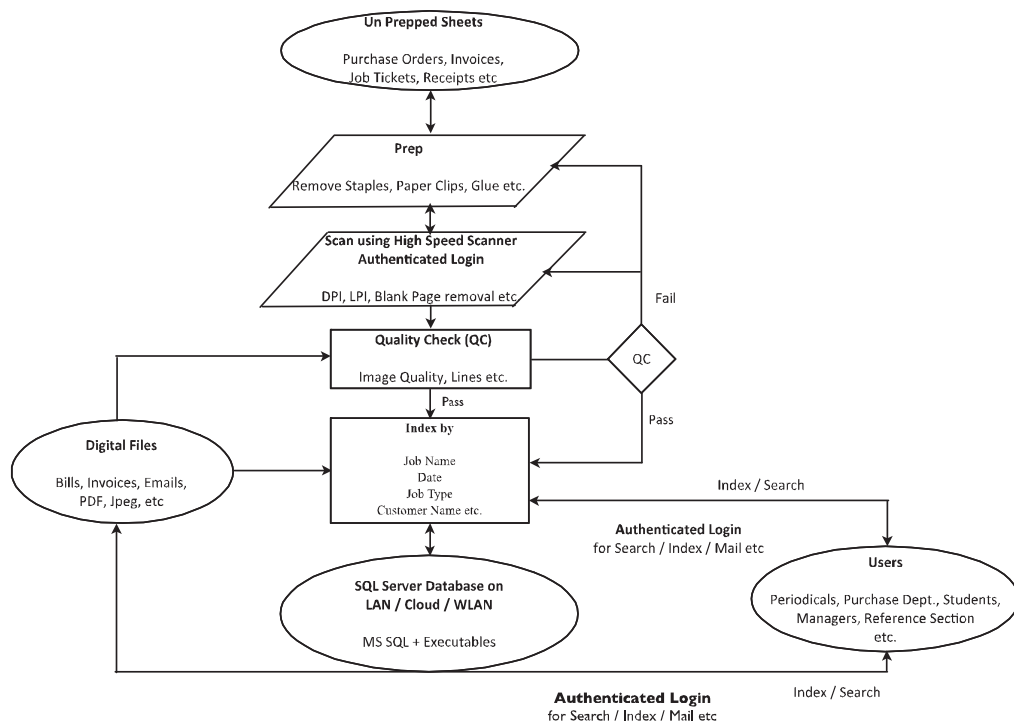


Figure 4: Proposed Workflow for accessing documents using EDMS for Library

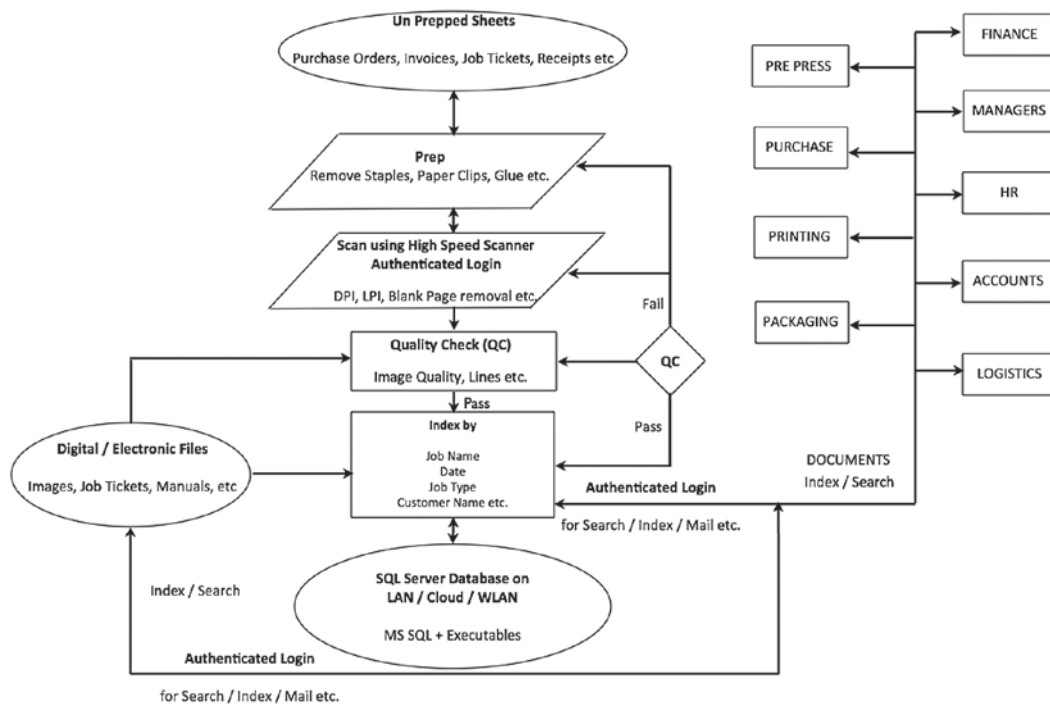


Figure 5: EDMS as a module for printing industry

It is evident that the following observations support the need of EDMS in the library for storage, access, instant and effective retrieval of documents as shown in Figure 3.

After implementing EDMS in the Library, it was observed that the performance of EDMS software can be increased if some problems can be solved in their very root. If documents are managed properly by finding missing documents regularly, keeping them rearranged, making quality check, converting each into soft-copy, keeping access privileges to access the information, it can be noticed that there is an improvement in the efficiency of EDMS software as far as searching and hence quick retrievals are concerned.

#### 4. Results and Discussion

Based on the functionality of EDMS software, a new method is proposed for storing, searching and accessing different documents efficiently. The following workflow gives an insight into the features of EDMS which have been implemented and meeting the requirements ever since. It is evident that the performance of information retrieval in the case of the Library has improved five-fold by using EDMS software. Figure 4 depicts the proposed digital workflow for the Library. This was tested for accessibility and found suitable for satisfying the needs in the Library.

A sequence of processes in the printing industry is a challenging task to accomplish. EDMS can be a solution in a highly preferable fashion. Such a workflow is proposed in Figure 5. It is possible to get the efficiency in storing, searching and accessing documents in the printing industry by introducing the EDMS, since most document-based processes are similar as seen in the case of the Library. Functional processes in the printing industry are mapped as shown in Figure 5.

#### 5. Conclusion and Future work

Electronic document management systems provide users with a much better access to digital information than a common user interface via a standard Internet browser technology. One of the main reasons why users prefer this level of technology is the distributed functionality and extent of digital information availability that can be accessed almost immediately after the implementation.

By working through the proposed workflow, it has become obvious that EDMS can be mapped to various processes in the printing industry. It is thus beneficial to implement an EDMS in Graphic Arts Industry in functional departments. Some application areas, very essential in the printing industry, where EDMS can be suitably introduced are stated below:

A few applications of EDMS in Printing Industry are as follows:

1. **COMMERCIAL PRINTING** - storage of different files in a structured way for different jobs so that they can be accessed quickly and efficiently, through the intranet/Internet; operator-user manuals; access to archived imposition templates, images etc.
2. **NEWSPAPER INDUSTRY** - documents can be archived and retrieved according to the date of publishing or any other similar parameters through the intranet/Internet
3. **PRE PRESS** – job parameters, data bank for images, customer files, job tickets, quality check of accomplished work. They could be retrieved instantly by extended and effective searching possibilities
4. **FUNCTIONAL DEPARTMENTS IN PRINTING INDUSTRY** - Implementing EDMS will be helpful in accessing, knowledge-sharing, managing documents like vouchers, bills, customer quotations, e-mails etc. instantaneously and in a more effective way

5. LOGISTICS: job status, incoming jobs, tasks assigned to different workers, e-mails and enquiries in the department can be tracked
6. MARKETING DEPARTMENT: online view of document status, quotes, pending bills, job orders and contact customers through e-mails
7. MANAGERS: can monitor the performance of each functional department, issue memos, sanction or decline leave
8. HUMAN RESOURCE: track employee records, review employee performance and audit trials
9. ADMINISTRATOR: can track employee behaviour regarding software use and abuse, activities performed at different times with the documents; can configure roles for individual users for software access and its usage according to the user

It has become evident that the Electronic Document Management Systems (EDMS) have matured in the past few years and now they offer significant cost savings and opportunities

for workflow improvements. Major benefits for having an EDMS are lower general costs, improved work flow, a significant reduction in the number of lost documents, better adherence to audit standards, search utility, better physical space utilization, well managed electronic space utilization, lower printing costs, better security on document access, disaster recovery (Lake, 2007).

In recent years, there are active moves to introduce XML as a standard data exchange format for electronic commerce and document management applications (Yao, Trappey & Ho, 2003). This would provide better, faster and more intelligent search results. It would also provide common language to reduce time and cost to develop interfaces.

Document management is not a single entity or technology, but rather a combination of elements. It is the use of information and different users in a business process, combined with the technology that permits interaction (Sathiadas & Wikramanayake, 2003). With all these benefits, it is a good move towards an office with less paper, by implementing EDMS in the printing industry and creating environmentally friendly publishing technology.

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